



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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Standard for design of electric vehicle charging station

电动汽车充电站设计标准

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1 General provisions

1.0.1 The standard was drawn up so that the design of electric vehicle charging stations carries out the relevant national policies, so that technical requirements are unified, and so that the result is safe and reliable, technically advanced and economically reasonable.

1.0.2 The standard applies to the design of electric vehicle charging stations that use the whole-vehicle charging mode.

1.0.3 The design of an electric vehicle charging station shall follow these basic principles: it shall carry out national laws and regulations and meet the requirements of the regional plan for national economic and social development; it shall be coordinated with the local overall regional plan and with town planning; it shall meet the requirements of fire safety, safe use of electricity and environmental protection; and it shall adopt new techniques, new equipment, new materials and new processes in an active but prudent way, so as to promote technical innovation.

1.0.4 Besides this standard, the design of an electric vehicle charging station shall also comply with the provisions of the relevant national standards in force.

2 Terms

2.0.1 EV charging station: a dedicated place that provides a charging service to electric vehicles, made up of several charging devices arranged together with the related power-supply devices, monitoring devices and ancillary facilities.

2.0.2 Power-supply system: the system formed by the electric power equipment and the distribution lines that supply the charging station.

2.0.3 Charging system: the system formed by all the charging devices, cables and related auxiliary equipment inside the charging station.

2.0.4 Monitoring system: the system that applies information, network and communication technology to supervise, control and manage the operating state of the equipment and the environment inside the charging station.

2.0.5 Metering and billing system: the devices and system used for energy metering and fee settlement between the charging station and the power grid and between the charging station and the electric vehicle user.

2.0.6 Charging equipment: equipment connected to an electric vehicle or to a traction battery by conductive or wireless means in order to supply it with electric energy.

2.0.7 Off-board charger: a dedicated device fixedly connected to an AC or DC supply which converts that supply into DC energy and charges the traction battery of an electric vehicle by the conductive mode; called the charger for short.

2.0.8 AC charging spot: a dedicated supply device that provides AC power by the conductive mode to an electric vehicle fitted with an on-board charger.

2.0.9 Group control charge: the function of allocating the output power among several charging interfaces dynamically, according to the charging demand and the load state of the system.

2.0.10 Indoor charging station: a charging station whose charging equipment and charging bays are inside a building.

2.0.11 Outdoor charging station: a charging station whose charging equipment and charging bays are in the open air or inside a structure.

3 Scale of charging station and site selection

3.1.1 The layout of a charging station should be settled by weighing together the types of electric vehicles and the vehicle population, and should make full use of existing conditions such as supply lines, transport terminals and fire-fighting facilities.

3.1.2 The scale of a charging station should be settled by weighing together the charging demand of electric vehicles, the average daily mileage of the vehicles, the energy consumption per unit of mileage and the technical capability of the charging equipment.

3.2.1 The overall planning of a charging station shall meet the requirements of town planning and environmental protection, and the station shall be sited where transport is convenient.

3.2.2 The site of a charging station should be near an urban road; it should not be chosen at the intersections of urban arterial roads or on heavily trafficked sections.

3.2.3 Site selection shall be closely combined with the planning and construction of the urban medium- and low-voltage distribution network, and shall meet the requirements for supply reliability, power quality and automation.

3.2.4 Site selection shall meet fire-safety requirements. A charging station should be built as a stand-alone facility, and the fire separation distance between the station and the buildings or structures outside it shall comply with article 11.1.1 of this standard.

3.2.5 Grade-one, grade-two and grade-three charging stations shall not be placed in production buildings, storehouses or liquid tank areas for category A and category B goods.

3.2.6 A charging station should not be placed where there is much dust or corrosive gas; where it cannot be kept away from such a source, it shall not be placed on the leeward side of the prevailing wind from the source of pollution.

3.2.7 A charging station shall not be placed where there is severe vibration.

4 General plan design

4.1.1 A charging station should consist of the buildings inside the station, the driveways inside and outside the station, the charging area, the temporary parking area and the supply and distribution facilities. The general layout of the station area shall meet the requirements of the overall plan and shall follow the principles of reasonable process layout, clear functional zoning, convenient traffic and economical use of land.

4.1.2 The general plan should be designed for the final scale of the station.

4.1.3 Charging stations may be divided into four grades by the number of charging bays N , as set out in Table 4.1.3. For an indoor station the four grades are N greater than 300, N greater than 150 and not greater than 300, N greater than 50 and not greater than 150, and N from 3 to 50 inclusive. For an outdoor station they are N greater than 400, N greater than 250 and not greater than 400, N greater than 100 and not greater than 250, and N from 3 to 100 inclusive.

4.1.4 Provided that traffic organisation stays smooth and the process layout stays reasonable, a charging station should be laid out to suit the natural terrain and should reduce the volume of earth and rock works.

4.1.5 A charging station should have its own separate vehicle entrance and exit.

4.1.6 A charging station should be laid out together with a surface car park.

4.1.7 Grade-one, grade-two and grade-three charging stations should not be placed inside important public buildings or civil buildings.

4.1.8 The charging area of a charging station should not be placed on the fourth floor of a building or above.

4.1.9 The charging area of a grade-one, grade-two or grade-three charging station shall not be placed in a semi-basement or a basement. Where the charging area of a grade-four station has to be built in a basement, it should be placed on the first basement level and at the vehicle entrance and exit of the basement, and it shall meet the requirements for fire rescue and for the safe evacuation of people and vehicles.

4.2.1 Charging equipment shall be placed near the charging bays; the clear distance between the outline of the equipment and the edge of the charging bay should not be less than 0.4 m. The arrangement of the charging equipment shall not hinder the charging or the movement of other vehicles, and measures shall be taken to protect the charging